DOCUMENT RESUME

ED 043 627 TE 002 056

AUTHOR	Nelson, Harold E.; And Others
TITLE	Instructional Uses of Videotape: A Symposium.
INSTITUTION	Speech Communication Association, New York, N.Y.
PUB DATE	Mar 68
NOTE	22p.; Reprinted from "Speech Teacher," Vol. 17, No. 2, March 1968
AVAILABLE FROM	Speech Communication Association, Statler Hilton Hotel, New York, N.Y. 10001 ($0.35, 10 or more $0.30, prepaid)
EDRS PRICE	EDRS Price MF-$0.25 HC-$1.20
DESCRIPTORS	Audiovisual Aids, *Audiovisual Communication, Closed Circuit Television, *College Instruction, Discussion Experience, Equipment Evaluation, Evaluation Techniques, Group Discussion, Instructional Aids, *Instructional Technology, Public Speaking, Sensitivity Training, *Speech Education, Speech Instruction, Teacher Education, *Video Tape Recordings

ABSTRACT

This collection of seven articles for the college teacher of speech relates specific ways that videotape has been used in training teachers and in teaching the fundamentals of speech, advanced public speaking, and discussion. Included are articles by (1) Harold E. Nelson, who explains how videotape is used in college speech classes to aid in acquiring speech skills, (2) Samuel Becker, John Bowers, and Bruce Gronbeck, who present the advantages and disadvantages of using videotape to teach group discussion, (3) James W. Gibson, who identifies and evaluates some ways to use videotape in the education of speech teachers, (4) Donovan J. Ochs, who describes an instructional unit on television used in an advanced public speaking course at a large university, (5) R.V.E. Reynolds, who discusses the techniques for utilizing videotape employed by a small college, (6) Adeline G. Hirschfield, who explains a study using videotaped speeches for self-ratings, class-ratings, and ratings by a team of judges, and (7) John H. Pennybacker, who discusses available equipment and sets guidelines for the evaluation of different types and sizes of videotape recorders. (FM)

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INSTRUCTIONAL USES OF VIDEOTAPE: A SYMPOSIUM

Harold E. Nelson

I. VIDEOTAPING THE SPEECH COURSE

EDITOR'S NOTE. The teacher of speech now has many teaching aids at his disposal. Innovators and salesmen are most eager to fill classrooms with these tools. In face of these pressures the important concern to those on the firing line is how to integrate the new approaches and instruments into effective teaching programs and how to use budgets wisely. This symposium attempts to provide answers to some of these questions. It considers how several successful teachers have made use of videotape. In the main the articles are intentionally practical and relate specifically how videotape has been used in teaching fundamentals of speech, advanced public speaking, discussion, and teacher training. Two of the articles have used an experimental approach. The final one discusses available equipment.

ANY innovation in the educational process is usually met with skepticism on the part of teachers that are concerned with what these new devices or procedures might detract or do to alter teaching effectiveness. In the field of speech the use of audio-taping is now commonly accepted as a means that can aid in the acquiring of speaking skills. Video-taping, however, is still subject to some scepticism by speech teachers as a teaching aid. The question concerning the teaching effectiveness of this new mode is a critical one, and is admittedly one that is difficult to evaluate. Not even those who sell the video-tape equipment will claim it is a teacher but merely a tool.

Many speech departments have been using video-taping in their classes, and in most cases the results have been heartening. At Purdue University videotape recording was used during the Spring Semester of 1964 in the beginning speech course. It was found that ". . . videotaping of speeches would be most valuable to students on their second speeches when they are over the initial confusion of their first speech and are just starting to think about the initial criticism of their delivery."[1] The Air Force Academy has also used video-taping in teaching speech, and the cadets in response to a questionnaire indicated that they found critiques were more meaningful when accompanied by the playback of the video-tapes; 72% of the responses indicated the playback aided "very much" and 28% found they aided a "moderate amount."[2] In a study conducted at the Speech Communication Center at the University of Wisconsin at Milwaukee by Frandsen, Larson, and Knapp, it was concluded, "The results of this study provide additional support, both objective and subjective in nature, for the use of video-tape in undergraduate speech instruction, and strongly suggest that the instructor effectiveness as a communicator may be enhanced by using this supporting device if he reserves his comments until after the student views the replay of his own speaking behavior."[3] At Southern Illinois

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[1] John Henderson, "Using Mirror TV to Teach Speaking," *NAEB Journal*, XXIII (Nov.-Dec. 1964), 53.

[2] Chester F. Caton and George K. Feather, "Teaching Speech with Television," *NAEB Journal*, XXIV (Nov.-Dec. 1965), 26.

[3] Paper prepared for presentation at the Conference of the Directors of the Basic Course of the Mid-Western Universities; Lawrence, Kansas, February 18, 1967.

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Reprinted from: The Speech Teacher, Vol. 17, No. 2, March, 1968

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University a set of video-taped informative speech models has been developed to aid in training teachers and students to rate speakers.[4] At Penn State speech instructors may use video-taping facilities on a voluntary basis. Both fixed studio and portable cameras and recording equipment are available as well as trained personnel to man the equipment.

In using any teaching aid it is necessary that it meet three questions: 1) Is it of aid in better teaching and motivating the student in acquiring the skill being taught? 2) Is it reasonably economical of instructor's time? 3) Is the cost of the equipment within the range of the institution?

Evaluating how effective the use of videotape is in teaching speech skills and how economical it is of instructor's time is the crux of the question. The author used video-taping as an aid in teaching the basic speech course. The class was asked on a voluntary basis if they would like to use video-taping, and it was decided to use it in a discussion assignment at the mid-point of the course. The students felt that a group experience before the camera would subject them to less "camera fright" than a solo performance. However, none of them in relating their observations later indicated that they experienced any undue anxiety by this taping situation. In order to economize on class and instructor time the four discussions (5-6 students on each panel) were taped in a television studio during class time. While the taping of one panel was being accomplished, the other panels were organizing and preparing for their taping with the help of the instructor. After the video-taping had been accomplished, the four panel discussions were played back to the entire class to be critiqued and graded. By using a studio set-up other than the classroom we avoided having the class see and hear the initial taping as well as the playback. However, some of the students claimed the studio taping was unrealistic in that it did not provide them with an audience. Other students liked the studio set-up because they felt it helped prepare them for television appearances in their later professional or community life. Most of the students agreed that their speech faults became more obvious when played back to them by video-tape. Many indicated they did not believe the criticisms until they observed them themselves.

Other student reactions included the following:

". . . when criticized I'll agree, but when I see and hear my faults I'm more apt to do something about it."

"I'd like to view the video tape with the instructor. The class viewings and criticisms are too hasty."

"I'm inclined to heed my own seemingly more realistic analysis of my speech after viewing the video tape as opposed to the listener's unreasonable one."

". . . I liked it in that it gave me a basis for comparison."

". . . I'm not sure how valuable it is for such elements as content or organization, supporting materials, etc., but it is of help in checking on delivery."

"It is my opinion that the added tension caused by this process and the trouble it entails in organizing is not evenly balanced by the small benefits it delivers."

". . . frequent taping would eliminate curiosity and novelty and make experience more objective and beneficial."

". . . helps me to see your point and I hope it also helps you to see mine."

4 Robert J. Kibler, Larry L. Barker, and Roy H. Enoch, "The Development and Preliminary Assessment of a Set of Video-taped Informative Speech Models," *Central States Speech Journal,* XVIII (November 1967), 275.

in the use of video-taping, these tentative conclusions also seemed justified. The easiest faults to point out in both face-to-face speaking situations as well as taped are those involved in delivery, but speech content can be analyzed and even replayed on tape for detailed observation. In an earlier use of closed-circuit television at Penn State the speeches given in one section were observed in other sections as models of both delivery and content. The Southern Illinois study referred to earlier involved viewing the entire process not just delivery. Undoubtedly the novelty effect helps in motivating the students to acclaim the use of video tape. There is perhaps enough "ham" in everyone that he like to see himself on film or on video tape. The use of video tape for several speaking assignments would help to make its use more objective and less dramatic. Some students who seemed rather reticent and shy in class appeared to lose this apparent "stage-fright" in front of the camera. Perhaps sharing attention with the camera, the same as with visual aids, tended to make them less concerned with themselves. Many students spent more time in preparation for their video taped speeches than for their usual classroom speeches. Whether repeated use of video taping would sustain this practice would have to be observed.

Presently a study is underway at Penn State in which two sections of the basic speech course will use video-taping as a supplementary device in speech criticism. In one situation the student speaker will view the tape with his instructor and in another will view it with one of his classmates. A questionnaire will be used to obtain some evidence as to which type critique sessions is of greatest benefit to the student.

Video-taping equipment is undoubtedly a teaching aid that lends itself effectively to the speech classroom. With planned use it need not add materially to the teacher's contact hours with the student. Most students seem enthusiastic about the use of video-taping. Their continued enthusiasm will undoubtedly depend upon the intelligent use of this teaching aid.

SYMPOSIUM:

Samuel L. Becker, John Waite Bowers, and Bruce E. Gronbeck

II. VIDEOTAPE IN TEACHING DISCUSSION

ONE of the major problems in the teaching of discussion is the multi-faceted one of developing sensitivity in students. We say multi-faceted because the student must become sensitive to a variety of phenomena. He must first become sensitive to the discussion itself—what is happening, the direction in which the discussion is going, what is needed to get it moving and keep it moving in a productive direction. He must become sensitive to others with whom he discusses—what they are trying to say, their knowledge of and attitudes toward the matters being discussed, and their reactions toward other participants, especially toward him. Probably most difficult, he must become sensitive to himself—what he knows and does not know, the effects of his knowledge and attitudes on his perceptions and behavior, and his behaviors while interacting with others. We believe that using videotape with discussion classes in the ways that we have used it at the University of Iowa increases the speed at which and the degree to which we can help students acquire these kinds of sensitivity.[1]

Videotape was used with two sections of a beginning discussion course during the fall and spring terms of 1966-67, each meeting for a 75-minute class period twice a week. All class discussions were videotaped and played back for the class. The videotape was viewed by participants immediately following half-hour discussions; videotapes of longer discussions were viewed at the next meeting of the class. Thus, most students discussed and saw themselves almost once a week. Two image orthicon cameras were used to pick up each discussion in a studio at the University of Iowa Television Center. The videotape was recorded on a quadrature machine. The use of this broadcast quality equipment meant that an electronics engineer was needed to supervise technical aspects of each recording. We believe that the additional costs for personnel and top equipment was more than compensated for by the increased picture and sound quality obtained. Using a television studio, rather than the usual classroom, also made possible better control of sound and, hence, better quality sound on the videotape.[2]

One of the criticisms teachers sometimes make when television is used in their courses is that they lose much of the control of instruction to the television director who, in most cases, largely controls the visual stimuli to which the students are exposed. We overcame this

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[1] In devising the uses of videotape described below, we were influenced by our experiences in the 1950's, when we experimented at the University of Iowa with the use of television for teaching political science and literature courses by the discussion method, and by the more recent experiences at Wayne State University and Antioch College.

[2] An additional advantage of these conditions was that videotapes could be transferred easily through the kinescope process to 16 millimeter sound motion pictures and used for other teaching purposes.

problem by having each instructor[3] sit in the television control room with the director and, in effect, direct the director. (We could have had the instructor direct the recording session, but he would then have been so involved in the technical aspects of the production that he could not have concentrated on what the student discussants were doing.) The instructor controlled five pedagogical devices during each session.

1. He could request individual shots of participants engaged in noteworthy productive or reactive behavior. For example, he might ask the director to show one participant who was doodling while another was talking, a close-up of another participant attentively leaning forward obviously encouraging the speaker, two participants whispering while another had the floor, and a close-up of a speaker's hand nervously jiggling a pencil as he talked.[4]
2. The instructor could request superimposition, at the bottom of the videotaped picture, of slides designed to be positively or negatively reinforcing to the participants. He had thirty-eight slides from which he could select by calling the appropriate number. On each slide was a word or two and a line drawing of a face, smiling when behaviors were to be positively reinforced, frowning when behaviors were to be negatively reinforced. For example, when a speaker used a *non sequitur,* a frown and the word LOGIC were superimposed under his face. Or, when a speaker used specific instances in an especially effective way, a smile and the word SUPPORT were shown under his image. When a student had no support where it was obviously needed, the word SUPPORT and a frown were superimposed. Slides with negative comments which were shown with a frown were:

Animism	Dialogue
Assumed Consensus	Digression
Authoritarian	Dismissal Reaction
Begging Question	Evasive Reaction
Clowning	Have Consensus
Dead Abstracting	Laissez-Faire
Logic	Recitation
Metadiscussion	Signal Reaction
Miss the Point	Stereotype
Morale	Support
Polarized	Unproductive Aggression
Orientation	Unproductive Clique
Railroading	Unclear

Slides with positive comments which were shown with a smile were:

Back on Track	Metadiscussion
Clear	Morale
Consensus	Productive Aggression
Dialogue	Productive Clique
Have Consensus	Support
Imaginative	Tension Relief
Logic	

3. Without stopping the discussion and unknown to the participants, an instructor could have the audio portion faded down and then make critical comments which were recorded on the videotape. For example, he might say: "You've been talking for fifteen minutes with no direction, as far as I can tell. You talk about surveys, and then you talk about some deep philosophical questions, and then you're on surveys again, and then you're on timetables with no attempts at establishing generalizations or reaching consensus or systematically moving the discussion forward in other ways. Somebody should be saying, 'Look, what do these things mean?' " Or the instructor might fade down the sound of the discussion and say: "*Finally,* Jim has tried a little metadiscussion. He's putting things in the perspective of the discussion. It's about time somebody did."
4. From the control room, an instructor could use a loudspeaker system to interrupt the students and talk directly to them. For example, at one time one instructor said to an especially shy student: "Janie, this discussion has been going on for forty-five minutes, and you haven't said a word. I can tell that you want to sometimes. We're going to keep the camera on you until you say something—anything."
5. Later, while the students were viewing the taped discussion, with its critical visual and oral comments, the instructor could stop the tape at any time to make additional comments, to amplify those on the tape, or to answer questions which students asked about the discussion.

[3] The instructor was Professor Bowers during the fall semester, Mr. Gronbeck during the spring.

[4] Cf. *The Student as Speaker and Listener* (Yellow Springs, Ohio: Antioch College and the Jack Wolfram Foundation, 1966).

Evaluating the relative effectiveness of various methods of teaching discussion is difficult. We have no standard measures and possibly no universally accepted behavioral goals. However, we attempted to measure some aspects of student sensitivity to discussion processes. These data are now being analyzed and will be reported at a later date. In no sense, however, was this a well-controlled experiment. We were interested only in exploring some of the problems and possibilities for using videotape with discussion classes and evaluating the outcomes of these explorations. On the basis of our observations, we can offer the following tentative conclusions:

1. Initially, the techniques we have described will seem frightfully complex and cumbersome to any instructor who tries them. He will be cast into a new role in which he is supervising a television production team as well as teaching a class. He must learn enough about the television medium to know what is technically reasonable and what is not. He must learn to see what is coming in the discussion, as well as what is going on at the moment and what has passed, so that he can forewarn the director. His responses must be quick. When he sees something occurring in the discussion, he must call for the slide to superimpose or call for the sound to be lowered and his mike opened before the discussion has moved on. Otherwise, his visual or oral comments will be separated on the videotape from the aspect of the discussion being commented upon, leading to confusion rather than clarification or reinforcement for the students. Generalizing from our somewhat limited sample of two instructors, we have concluded that most will adapt quickly to this new teaching technique.

2. Students seem to respond well to this mode of learning. We have concluded that the bulk of them will prefer this sort of instruction to that found in the usual course in discussion. This conclusion is based upon our observations of the in- and out-of-class behaviors and comments of students in both types of sections and upon the responses of students in both types of sections to an informal questionnaire at the end of the first term.[5]

3. Obviously, this method of instruction results in each discussion taking much more time since, in effect, each is gone through twice—the original plus the playback. Though some time may be saved by more efficient criticism (especially those criticisms which are superimposed on the tape), the instructor is forced to have fewer discussions during the term or to cut down on other aspects of the course.

4. This method is expensive. In addition to the instructor and engineer, equipment and tape depreciation, it requires a director, an audio operator, a video control operator, and two cameramen. Though most, if not all, of the crew members may be students working for experience only, the time and cost of organizing and supervising their work is substantial. We can see no way to bring down the cost of this method of instruction even to approximate the cost of the more usual methods of teaching discussion.

In spite of the disadvantages noted, we are convinced that the use of videotape in the teaching of discussion shows sufficient promise that we must continue exploring its possibilities.

[5] This result should be viewed with caution because of a number of confounding factors in this comparison, including different instructors and different types of discussion assignments. In addition, the samples of students were small. Also, our finding is contrary to the results generally obtained when college students are exposed to most types of televised instruction. It has usually been found that college students prefer more "conventional" means of instruction.

SYMPOSIUM:

James W. Gibson

III. USING VIDEOTAPE IN THE TRAINING OF TEACHERS

TWENTIETH century technology has made it feasible for teacher training institutions to purchase and use television and videotape recorders as a primary instructional aid in preparing elementary and secondary school teachers. Persons familiar with videotape recording commonly list as its advantages: (1) comparatively low cost, (2) immediate opportunity for replay of tapes, and (3) almost indefinite tape re-use capability. Experimentation with videotape in teacher education has been limited, but Popham reports that on tests evaluating the effectiveness of several media approaches the highest scores were made by subjects exposed to videotaped instructional stimuli.[1]

Despite the demonstrated utilizations of videotape recording in teacher training programs[2] its potential uses in speech teacher education have not been discussed. This paper attempts to identify and evaluate selected methods for the use of the medium in teacher education.

Micro-teaching. The teacher training program can effectively integrate videotape recordings when it operates in micro-teaching situations. Micro-teaching is a scaled down teaching exercise in which a small unit of material, perhaps five to seven minutes in length, is presented, recorded, and subsequently critiqued.

The teacher of a methods course in speech may have students prepare a five to seven minute teaching unit on methods of support for main ideas. Their presentations are recorded on video tape and rerun immediately for their observation. Replaying of the recorded micro-teaching experience is most efficient when during the follow up the supervisor points out one or two specific behaviors warranting comment.[3] The probability of improved student performance is increased when students reteach the same unit a short time later, integrating the suggestions offered by the instructor.

Convincing evidence of the effect of micro-teaching appears in the Stanford University research which reports that micro-teaching performance predicted subsequent classroom performance.[4] It is possible to integrate the micro-teaching approach suggested for any of the units typically developed in the speech methods course, units ranging from voice and articulation to parliamentary procedure.

Model teaching tapes. It is widely agreed that performance models are among our most effective teaching instruments. As teachers of speech, we in-

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1 W. James Popham, "Instructional Video Tapes in Teacher Education," *AV Communication Review,* XIV (Fall 1966), 371-376.

2 See Herbert Schueler, Milton Gold and Harold Mitzell, *The Use of Television for Improving Teacher Training and for Improving Measures of Student-Teaching Performance—Phase I, Improvement of Student Teaching,* U. S. Office of Education, Grant No. 730035 (New York: Hunter College, 1962), and James M. Cooper and Thomas Stroud, "The Stanford Micro-Teaching Clinic, 1966" (Stanford, California: Stanford University School of Education, 1966), 21 (Mimeographed).

3 Cooper and Stroud, *op. cit.*

4 Robert N. Bush and Dwight W. Allen, "Micro-Teaching, Controlled Practice in the Training of Teachers" (paper read at the Santa Barbara Conference on Teacher Education of The Ford Foundation, Santa Barbara, California, April 30, 1964).

struct our students to read speeches acclaimed as classics. The preparation of teachers can follow the same general route. When a student micro-teaches a unit in an unusually effective and creative manner, his performance should be extracted from the video tape and preserved for replay to methods classes in succeeding terms. Following this procedure for several quarters or semesters results in the development of a library of model performances, and the instructor may use the tapes to illustrate an effective method of teaching oral interpretation, or any of the other units included in the methods course.

Rater training. Studies of the rating of speeches have demonstrated that the individual tends to be unreliable, whether compared with other raters or with himself over a period of time. Programs for rater training have been limited to only two investigations.[5] Both studies have implications for the use of video taped model communications in training teachers to judge student speaking performance. Student speeches in an introductory speech course may be recorded and these recordings then edited and scored by a group of speech teachers or by the instructor himself. The model tapes for rater training would possess greater validity if several speech experts participated in the evaluation process. The instructor should retain three groups of speeches, representing models of "good," "average," and "poor" speaking, and subsequently use them as training devices. A minimum of three tapes in each category will suffice for training purposes.

The instructor should select one of the taped speeches rated "good," one rated "average," and one rated "poor" to project for the class. During the showing of each of the tapes the instructor should stop the tape when a behavior critical to effective communication is exhibited by the speaker. When the difficulties occur, the instructor should describe the nature of the problem and relate it to total speaking performance. Both positive and negative behaviors should be identified. After students have observed the three tapes of speaking performance and have been exposed to expert evaluative comments on the speeches, they should be required to engage in the rating of speeches themselves.

Another set of taped speeches could be presented to the class and the students might then be directed to rate each of the three communications, using an experimentally validated speech rating instrument, such as the Price,[6] or Gilkinson and Knower[7] scale. After student rating, the tapes should be replayed with accompanying instructor evaluation of the speaking behavior. Student ratings of specific categories of speech behavior should be examined, and students whose ratings vary significantly from the evaluations rendered when the model tapes were selected should receive appropriate attention and instruction from the teacher of the methods course.

Training in criticism. The previously described tapes of speaking performance also might be used for training in speech criticism. Thorough discussions of the principles of reinforcement and learning psychology should precede any student participation in criticism. After

[5] See John Waite Bowers, "Training Speech Raters With Films," *Speech Teacher,* XIII (September 1964), 228-231, and Robert J. Kibler and Larry Barker, "Training Raters Through Video Taped Instruction" (paper read at the Speech Association of America Convention, Los Angeles, California, December 27, 1967).

[6] William K. Price, "Derivation of a Rating Scale for Public Speaking," University of Wisconsin, Communication and Public Address Experimental Laboratory, JR-004, April 1961.

[7] A. Craig Baird and Franklin H. Knower, *General Speech* (New York: McGraw-Hill, 1963), p. 24.

rating the "model" speeches, each student should be directed to present an oral critique of the speech. Student enthusiasm for critiques of taped speeches may be limited because of the student perception that the performances are merely laboratory specimens. This difficulty may be reduced if the instructor assumes the role of student speaker during the evaluation period. Because student reactions to speech classroom criticism are reasonably predictable, the role playing instructor should raise the types of questions, comments, and objections typically introduced by student speakers when performances are evaluated. Thus, a more realistic training situation for the prospective teacher could be developed.

Verbal Interaction Training. The query of Amidon and Hunter, "Why is it that teachers tend to do most of the talking (about 70 per cent in the average classroom, according to Flanders),"[8] is relevant to instructional improvement in speech. Teachers of speech, as well as instructors in other disciplines, are probably unaware of their own classroom verbal behavior. The extent of this problem in intern teachers may be reduced using an adaptation of the Amidon-Hunter technique. During the micro-teaching situations, the role played classroom interaction (student-teacher question and answer activity) could be analyzed using the Flanders Verbal Interaction Category System, or another method for interaction analysis. After the micro-teaching unit has been taped, the replay should involve instructor identification of the nature of pupil and teacher talk. This identification also should involve suggestions, by the instructor, of the type of questions which would stimulate interaction, the type and timing of teacher approval or disapproval of student behavior, and identification of situations where teacher initiated ideas are appropriate.

It should be remembered that the objectives in replay of micro-units must be clearly delineated in the mind of the instructor, because replay for interaction analysis requires frequent comments while criticism of general teaching techniques is most beneficial if only a few critical behaviors are identified.

8 Edmund Amidon and Elizabeth Hunter, *Improving Teaching The Analysis of Classroom Verbal Interaction* (New York: Holt, Rinehart and Winston, 1966), p. 2, citing Ned A. Flanders, *Teacher Influence, Pupil Attitudes and Achievement,* U. S. Department of Health, Education and Welfare. Office of Education, Cooperative Research Monograph no. 12 (Washington, D. C.: U. S. Government Printing Office, 1965).

SYMPOSIUM:

Donovan J. Ochs

IV. VIDEOTAPE IN TEACHING ADVANCED PUBLIC SPEAKING

IN the book entitled *Learning by Television,* which was recently published by the Fund for the Advancement of Education, the authors ask, "After more than a decade of intensive effort and the expenditure of hundreds of millions of dollars, has television made a real impact on America's schools and colleges? Has it made a worthwhile contribution to education? The short answer to such a sweeping question would probably have to be no."[1] Elsewhere in their book the editors indicate that part of the problem can be laid at the feet of ETV stations which are run by administrators who are broadcasters rather than educators.

In 1965 the International Research Associates were commissioned to conduct a survey of attitudes toward televised instruction among teachers, administrators, students, and parents. One significant finding of this study disclosed that college teachers were more averse to instructional television than any other professional group, and college students had the most negative attitude of all groups surveyed, disliking most of all the lack of contact with the teacher in the typical instructional television situation.[2]

It is unfortunate indeed that a communication gap should and, in fact, frequently does exist between the classroom teacher and the personnel in charge of instructional television facilities. It is difficult for a teacher, unversed in the capabilities and limitations of the television medium, to know how to use this instructional tool. The purpose of this article is to share several years of experiences in using a television unit in an advanced public address course and to encourage secondary and college teachers to experiment with television in their classrooms.

Three years ago, student interviews and questionnaires revealed that, for the most part, students perceived the advanced public speaking course as "giving more speeches, sometimes of different types, to a different teacher." Although different emphases—primarily, oral style, audience and message analysis, and the non-verbal dimensions of interpersonal communication—were stressed in assigned reading, lectures, and discussions, the students apparently perceived few significant differences between the first and second courses in public speaking. To remedy this milieu the TV unit was developed in conjunction with the Educational Television Department.

After several discussions with the ETV Chairman, Charles Nearing, and the studio manager, James B. Williams, we decided to move the students from their assigned classroom into the studio for the videotaping and playback sequences. The equipment which we used consisted of an EMI camera equipped with a 10:1 Angeno Zoom Lens, an Ampex 7000 videotape recorder, and a 27 inch modified Setchell-Carlson monitor.

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1 *Learning by Television,* eds. Judith Murphy and Ronald Gross (New York: The Fund for the Advancement of Education, 1966), p. 9.

2 *Ibid.,* p. 9.

The planning phase of the unit was based upon the following principles:

(1) An instructional unit is best evaluated in terms of the intensity and durability of the educational experience itself and not in terms of efficiency. In other words, one meaningful classroom learning experience was considered superior to a number of mediocre efforts despite the number of class hours involved.

(2) Immediate reinforcement, positive or negative, is generally more lasting than delayed reinforcement. Reinforcement theory would suggest that a more enduring behavioral change occurs if the reinforcement (positive or negative) takes place as close to the behavior as possible. In other words, a student speaker should be critiqued in some fashion immediately after he speaks. Such is the nature of the speech act in the classroom setting, however, that most students are usually not receptive to oral criticism immediately after completing their assigned speech. Written criticism, if prepared during the speech, is frequently undesirable since the critic must tend to his writing and miss portions of the speech. If prepared after the speech, the opportunity for immediate reinforcement is lost.

(3) Of the three *loci* of classroom criticism—i.e., the instructor, a classmate, or the speaker—self-generated criticism is most effective in producing desired behaviors. Carl Rogers, for example, would argue that self-discovered and self-motivated behaviors are, in the long run, the only ones which produce significant changes. A. S. Neill, founder of Summerhill, has demonstrated that students learn more quickly when the need to learn is experienced.[3]

(4) Fear of a new experience can be largely eliminated by removing the penalties for possible failure. Stated as an objective, therefore, each speaker should experience the need to analyze in depth his particular audience, his message, the messages of others, and perceive the approximate impact of his non-verbal communication habits.

Early in the quarter the class was assigned an eight to ten minute informative speech to be videotaped on a specific date. Each student could use a speech given previously in another course or prepare a new one. To reduce initial anxiety the student was told that his presentation would not be graded. Each student, however, prepared a written self-analysis after his speech was videotaped. When the playback sessions were completed some days later each student prepared a second self-analysis, compared the two papers; and these, in turn, were graded.

Between the time of the initial assignment and the videotaping, lecture-discussion sessions reviewed principles of informative communication. Also, suggestions were made about adapting to the studio situation. All the student speeches were videotaped with the entire class present in the studio before any discussion of the presentations took place. Each was encouraged to take notes and make written observations of the communication practices which he observed in his classmates. Students seemed more comfortable and less distracted with the camera positioned behind the live studio audience rather than elsewhere. This enabled the speaker to react to visual feedback from his classmates and they, in turn, were not disturbed by watching the camera or the monitor.

By operating the camera myself, I could magnify or minimize strengths and weaknesses of non-verbal messages depending on the size of "shot" I used. For example, note card fumbling or distracting hand gestures, stiffness, distracting mannerisms, excessive reading of notes, could be forgiven with a "shoulder shot" or retained for later viewing with a "full shot." The speech teacher-camera operator, thus, can judiciously write an electronic critique which, in itself, is non-verbal.

Since the verbal message was also recorded on the sound track it was possible to preview the tapes and prepare suggestions before the playback phase. The instructor's written critique could

[3] A. S. Neill, *Summerhill: A Radical Approach to Child Rearing* (New York: Hart Publishing Co., 1960).

then focus on such aspects as pitch, loudness, timbre, variety.

To encourage each student to improve his listening abilities I required five or six students to serve as "paper critics" for each playback, while the remainder of the class served as oral evaluators. The suggested format for the written criticism was brief: What one aspect of good speaking did you observe? What specific advice can you give to improve this speech? Other helpful suggestions? The paper critics were given two days to complete their written reactions, which were graded and returned to the speaker. Open-ended questions such as these tended to produce a varied and mixed qualitative response. Not only did the responses serve a diagnostic function in that the instructor could learn what the student already knew about the principles of effective communication, but this device also encouraged the student to learn theoretical material. The nature of this critical task enabled the student to apply his lecture notes and the relevant theoretical material in his textbook.

Numerous instructional options existed during a playback sequence. Excellent portions of a student speech could be re-played for minute analysis and comment, oral style could be discussed, weak phrasing or structuring could be singled out, audience reactions could be verified as the speech moved from topic to topic, and, if desired, the teacher could be explaining a theoretical concept to the class while the monitor was playing back an audio-visual illustration.

In order to evaluate and improve the instructional unit a student feedback questionnaire was used as the concluding phase of the TV unit. On the basis of student responses the following tentative suggestions seem in order:

1. Repeating the same speech would be profitable if the speaker could incorporate the critical suggestions he received then confront a different audience.

2. The threat of social disapproval was negligible. Student reactions indicated that since the unit was conducted as a laboratory learning experience, as opposed to a classroom competitive exercise, they were able to focus their attention on the principles of communication without worrying about grades.

3. Nearly all of the students agreed that it was beneficial to watch the playbacks of the entire class since this provided an opportunity for them to check the accuracy of their initial observations and written criticisms. Furthermore, student speakers wanted their classmates present during the videotaping sessions in order to learn from each other.

4. Most students did not believe that using a speech given previously in another course was beneficial. This finding tended to indicate that they had learned the importance of adapting their messages to their audience and the situation. And, since both the audience and situation were new to the students, their messages, to be successful transmissions of thought, needed to exhibit adaptation.

5. When asked what specific principles of communication each had learned, nearly all students responded the necessity of audience analysis, precision in the use of language, and the need for careful preparation and rehearsal. The advantage of a student viewing himself several days after his live communication did seem to lend greater objectivity to his own self judgment. Defense mechanisms, false modesty, and inordinate ego-involvement were quite useless and unnecessary when the student was confronted with the playback of his own communicative act.

SYMPOSIUM:

R. V. E. Reynolds

V. VIDEOTAPE IN TEACHING SPEECH IN A SMALL COLLEGE

AT least twice and sometimes weekly during the past four semesters, every student enrolled in a speech performance course delivered his speech before the video camera and then viewed his presentation. Some 1800 students at Loras College have taped and replayed nearly 25,000 speeches on our videotape recorder.[1] That is what we set out to do when we purchased our VTR equipment; that is what we have tried to do since; and this is how we have gone about the task.

We have noted that a speaker who views himself on television can experience a sense of achievement in seeing how well he has performed, a sense of embarrassment in seeing how poorly he has spoken, and sometimes a sense of utter amazement at simply seeing and hearing himself. These may be desirable though admittedly limited goals. And these are often our major goals for a student's first video recording. More often, however, we attempt to design our video assignments around goals of appropriate platform behavior, effective use of visual aids, or direct and dynamic audience contact. For the purposes of comparison, we may make an expository assignment late in the semester similar to one given and recorded earlier in the course, so that signs of growth and promise, areas of persistent trouble, and an occasional new problem are more easily recognized. And we attempt to use the video sessions to teach the student standards for analyzing and criticizing oral presentations. But perhaps one of our most important aims is to provide the student with an image of himself as a speaker which is closely related to that which his audience sees and hears, a real image which he can evaluate more objectively and can compare with other speakers more meaningfully.

Although videotaping sessions offer educational advantages not readily provided by other teaching aids, we did not want the taping experiences to be so much "special events" as we wanted them to be natural, integral speaking assignments.

To create an unstudio-like speech lab which would retain its classroom character, we equipped a classroom with acoustical ceiling tiles, sound deflecting walls, and excellent overhead lighting. We added enough armless chairs to accommodate our largest speech class. In the front center we placed a regular classroom lectern and a microphone on a stand.[2] In a front corner, facing the rows of chairs, we mounted our 23" television monitor. Among the chairs, we positioned our television camera. On a long table across the rear of the room, we arranged our video tape recorder, 9" television monitor, domestic and foreign recording tapes, and master electrical switches. Thus, the class members

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1 Loras College has a student body of 1600. The Speech Department has four faculty members.

2 The speech lab equipment consists of a Shure "Dnidyne III" microphone, a 23" Setchell-Carlson 2100-SD monitor, a 9" Panasonic transistor monitor, a Concord MTC-12 automatic television camera, and a Concord VTR-600 solid state video tape recorder.

sit in a mass of chairs, the speaker faces his live audience, and the instructor sits unobtrusively in the rear of the room writing his critique and pushing a few recorder buttons.

The student's first videotaping experience occurs early in the semester, by the second week of class, and is usually his second speaking assignment. We mention that the speech will take place in the speech lab, will be videotaped, and that afterwards the student will be able to see and hear his own performance. We briefly suggest some of the advantages to be gained from the procedure. If questioned about clothing for the television appearance, we reply that whatever is worn that day will be suitable. Our aim is to prepare the student for the assignment but not to add significantly to his apprehension and stage fright problems. For subsequent video appearances, we are more explicit in what is to be attempted and expected. We try to extend the lessons of previous tapings and may give the student criticizing duties while he is listening and observing.

Our regular classroom procedure for speaking assignments is to hear one- to five-minute speeches for one to three class periods. We may comment orally after every few or after all the speeches. We do write critiques on analysis sheets for each speaker, giving each student his copy of the written remarks, and filing a duplicate copy for later conference use. During his listening time the student initially notes the more obvious weaknesses and strengths of speakers, and later he writes detailed analyses of his speaking colleagues.

In the videotaping sessions, we continue these practices with only minor alterations. We prefer to record all the students in a class for a given assignment before replaying or criticizing any one speech. Since one shot appraisals of a speaker's performance can be too stringent or too charitable, we feel that an overnight break increases the probability that our evaluations during replay will be more balanced and thorough. Too, we may mention and draw attention to what a speaker and other speakers will do as we have already seen and heard those speeches and have written criticisms of them. Since the student speaker is limited to a small area adjacent to the lectern and microphone, and since the camera adjustment is set for the class period, we have few engineering or directing details to be concerned with other than threading the videotape and getting the equipment functioning properly. Hence, we continue our practice of writing individual critiques of each speaker while he is talking live, making a special note of the tape counter setting when the student begins his speech.

For the speaker the camera is just another member of the live audience before him. He is not distracted by any bright lights, or roving camera, or hot monitor. During live speeches, the large, classroom-size monitor is dark, so that the listening student tends to his observing and criticizing the presentation. After some training in evaluating speeches, a student may be asked to write an analysis of his own speaking immediately after he has been videotaped but prior to viewing any playback; he will use his analysis when he sees himself as a speaker during replay.

Playback sessions are handled variously, but generally we will begin by reviewing the main objectives of that particular assignment. The student then watches himself and his classmates on the large, classroom-size monitor. We usually reduce the audio volume during replay so that our running comments

can be heard more easily. We may comment intermittently, or we may dub the tape's audio track; we will base our remarks on what we have previously observed and written on the performance, plus whatever else seems relevant and helpful. Some of our comments are directed to the student whose image is before us to emphasize what we have already written on his analysis sheet. Some of our comments are for the instruction of the class as a whole. We may stop the tape for a fuller explanation of what is or is not occurring. We may go back and repeat some portion of the tape. We may skip ahead to view and comment on selected moments of each speech. Whether he is eye-minded or ear-minded, the student who sees and hears himself and simultaneously hears commentary on what he is doing or how well he is doing it, more easily identifies his personal practice with the general theory of speech making. Too, he does more than merely half-believe our post-speaking comments.

During replay the student is free to comment or to ask questions regarding the behavior on the screen, and he often does. At the end of the replay, the student may enter into the general discussion about the assignment, about the performances, about the criticisms, or about the videotaping experience. These discussions immediately following replays are usually lively, immensely popular, and—we hope—somewhat helpful to the student. Student opinion of the video experience is highly favorable, and the student is likely to demand even more video time. He seldom misses a speech assignment scheduled in the speech lab.

A student may also request additional viewing of his own speaking. He may use the video equipment for practice.

Our care and maintenance system is simple. We keep a log of every use of the videotape recorder, noting when the instrument is used, for how long, by whom, and any trouble which may appear. For statistical purposes, we also indicate how many students are involved. Often we detect potential trouble before it grows too big. When a problem does develop, our log provides information in depth. Since the VTR is especially sensitive to dust and dirt, we keep all our equipment covered (a plastic drop cloth) whenever it is not in use. Every hour during use, we depress the automatic head cleaner button, and after every eight hours of use, we clean all rotating heads with a commercial head cleaner. Although the manufacturer claims portability as a feature of our VTR, we have yet to move any of the equipment out of the speech lab. A master on-off electrical switch helps us to keep every piece turned off when not in service.

As more money becomes available, we hope to add to the equipment in our speech lab: a zoom lens attachment, a dolly for the camera, and reels and reels of recording tape. We want to collect sample speeches, records of the best speeches, illustrations of ineffective presentations.

Eventually we want to give each student his individual reel for recording and viewing his performances. And we might even dream of a speech center with several well equipped speech labs.

When we purchased our first piece of equipment, we determined three objectives: 1) simplicity and ease of use, 2) effective use of the aid as an integral portion of our speech performance courses, and 3) diverse and extensive use of the aid for enhancing oral presentations. And that is how we have gone about our task.

SYMPOSIUM:

Adeline Gittlen Hirschfeld

VI. VIDEOTAPE RECORDINGS FOR SELF-ANALYSIS IN THE SPEECH CLASSROOM

UPON viewing himself on the television screen a typical student reacted: "You discover things about yourself you want to start changing, and maybe, also things that are better than you thought."[1] Videotaping is a logical extension of the speech teacher's long advocacy of audiotape recordings for student self-analysis. The added visual dimension permits the student to see the effect of his projected personality, thereby relieving the teacher of the often difficult responsibility of pointing it out to him. Motivation to improve is thus transferred to the student himself.

These observations are the results of testing videotape recorders at Wayne State University in a 1964-1965 study made under an NDEA Title VI grant. Answers were sought to the following questions: (1) Is videotaping worth the investment of time, effort, and money? (2) How objective are students in evaluating themselves? (3) Is there any advantage in using *classmate* evaluations, and how accurate are they? (4) How early can these diagnostic recordings be made? (5) Can the average beginning speech student bear the possible trauma not only of facing a TV camera, but also of seeing and hearing himself in the presence of his fellow students?

Procedures. Five sections of randomly selected speech students taught by three different instructors were videotaped as they delivered one and one-half to two minute extemporaneous speeches describing vividly remembered personal experience. By trial and error, time-saving and relatively tension-free procedures were developed, and twenty or more students were easily recorded in a fifty-minute period.

The placing of the initial recording varied: two groups were videotaped in the second week of the semester and three were delayed until the seventh week. In playbacks students evaluated not only their own presentations but other students' speeches as well. Each speech was viewed and scored immediately on a rating chart during a replay of the audio portion (for recap of possible missed details).

In a 1939 study of audiotape self-analysis, Clarence Nystrom and Roberta Leaf found that merely listening to recordings effected no more improvement than not using them at all, and suggested that students require assistance in identifying speech assets and faults.[2] Accordingly, a speech rating chart was developed for the present study using descriptive questions on sixteen accepted speech criteria (see Table I) plus a general rating. Since videotaping is directed toward improvement of *delivery,* the chart was heavily weighted in this item.

The rating chart also included two open-ended questions on personality, so that speakers could learn about any

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1 Student quotations are drawn from a Fall 1967 experience at Oakland University using a Sony videotape recorder in the speech classroom.

2 Clarence L. Nystrom and Roberta Leaf, "The Recording Machine as a Teaching Device," *Quarterly Journal of Speech,* XXV (October 1939), 433-438.

TABLE I
COMPARISON OF AVERAGE RATINGS BY ITEM: SELF, CLASS, JUDGES

Student Rating Questionnaire Item	Early Group			Late Group		
	Self	Class	Judges	Self	Class	Judges
1. Eagerness to communicate	4.23	4.30	3.53	3.86	4.20	3.43
2. Physical expressiveness	3.20	3.60	3.33	3.40	3.83	2.93
3. Physical control	3.26	3.90	3.23	3.03	3.83	3.23
4. Stage fright	3.33	2.50	2.63	2.66	2.23	1.83
5. Sincerity	4.23	4.43	3.70	4.16	4.16	3.56
6. Adaptation to audience	4.23	4.16	3.50	3.90	4.03	3.20
7. Opening	4.00	4.10	3.60	3.80	4.10	3.53
8. Body	4.16	4.30	3.60	3.80	4.00	3.13
9. Conclusion	3.56	3.96	3.46	3.40	3.63	2.53
10. Fluency	3.73	3.93	3.43	3.30	4.03	3.36
11. Conversational style	3.73	4.10	3.66	4.00	4.23	3.63
12. Grammar, pronunciation, and vocabulary	3.83	4.13	3.53	3.86	3.90	3.46
13. Vocal responsiveness	3.83	4.03	3.66	3.80	3.76	3.30
14. Pleasant voice quality	3.40	4.20	3.30	3.53	4.10	3.43
15. Articulation	3.50	4.10	3.00	3.16	3.96	3.23
16. Accent—degree	1.90	1.36	1.20	2.03	1.80	1.90
17. General rating	3.60	3.80	3.50	3.40	3.66	2.96
Average (all items)	3.96	4.06	3.46	3.63	3.96	3.26

5 = A (decidedly yes), 4 = B (moderately yes), 3 = C (somewhat or in between), 2 = D (moderately no, or hardly), and 1 = E (decidedly no).

unique characteristics which others viewed as assets and also find out what kind of first impression they tended to make. For recording the latter information, raters were asked to cast the speaker into an appropriate TV role.

Ratings were immediately tabulated and made available to each student for comparison of his own self-rating on each criterion with the average rating of his classmates. To measure the objectivity of student raters, all videotaped speeches were subsequently rated by teams of three judges, and their averaged ratings on each criterion served as the yardstick for "accuracy."

Results and Discussion. On the five-point scale of the rating chart, student evaluations of their own and their classmates' speeches were fairly accurate—within a point of the average of judges' ratings in almost all categories (see Table I); and this objectivity seemed to be unaffected whether the initial recording was made in the second or seventh week of the class.

An interesting phenomenon was a *consistent pattern* of rating: classmates rated highest, followed by the student himself, and judges rated lowest. There were two notable exceptions: (1) students observed more *stage fright* in their speaking than classmates or judges, and often expressed surprise that so little of what they felt inside was observed by the audience; and (2) of special significance to the voice and diction teacher was the tendency for students to observe more *accent* and *regionalism* in their own speeches than did classmates or judges. In my experience, this is not as true of audio recordings alone.

Expectations that early (first or second week) recording time is preferable was confirmed by this experiment. Objectivity of self-analysis did not markedly differ between the second and seventh weeks, and, of course, the earlier self-analysis gives additional weeks for improving recognized faults.

As for the stage-fright factor, this was not found to be highly significant even in the original experiment at Wayne State University, where recordings were

made in the TV studio. When, as at Oakland University, the portable equipment is brought into the familiar setting of the classroom, fear is reduced to the level of the typical individual reaction to a classroom speech. At any rate, the original experiment did not demonstrate any significant *lessening* of stage fright when recording was delayed until the seventh week.

On the other hand, seventh-week recording slightly *increased* tendencies for acquaintanceship bias and overrating of classmates' speeches. A count of the separate instances in which ratings of classmates exceeded judges' ratings by more than one point on the five-point scale showed this occurring 8 per cent of the time in the second-week recording group as compared to 15.3 per cent in the seventh-week group.

These combined findings would tend to recommend TV recordings at the earliest possible time.

Though some experimenters allow students to see only their own playbacks, my experience strongly recommends *classmate* evaluation of the videotaped speeches, for two reasons: (1) Those of us who have seen ourselves on film and TV are not surprised at student descriptions of the experience as "shattering" and "shocking." Some sensitive students react with real despair, sometimes only partially mitigated by seeing that they are not that much worse than their classmates. Though they tend to criticize their classmates for being "overly friendly and kind" in their assessments, these opinions often prevent the student from following his first impulse to give up. "In judging myself, I had tried to be as impartial as possible, and thus concluded that I was dull and quite amateur. My reaction to the class's assessment and comments upon my talk was one of surprise in that they were so kind and generous."

(2) Repeated observations and identification of speech criteria in classmates' speeches are sound learning experiences for beginning speech students. As one student aptly wrote, "By actively participating in the evaluation, we must become more aware of the essential elements of a good speech. . . . It was an excellent means of introducing us to the art of communication."

Not all the findings in this study are reflected in the statistics. We found during the pilot phase, in a trial and error search for the best procedures to use, that a sample of a student's natural, unmemorized, conversational speech is not always easy to record. And if the student can look at himself and say, "That's not the way I usually talk; I was too scared!" the experience is pointless. On the basis of what we learned from some early mistakes, then, these recommendations for procedures are strongly urged: (1) assignment of a personal narrative to reduce student fear of forgetting; (2) assurance that evaluations of the TV speech will not be part of the final course grade; and (3) maintenance of a friendly, casual atmosphere during the recording and playbacks, even on the part of the cameraman.

When students in evaluative questionnaires were asked for their opinion of the TV experience, the overwhelming response was one of enthusiasm. Ninety per cent even called it "enjoyable." The following student quotation is a fairly accurate summation of these subjective reactions:

> It is an interesting and shattering experience. Most people have certain ideas on how they wish to appear to others. When I found out that the "image" was definately [*sic*] not getting across my first thought was, "what am I doing wrong?" When this question is answered, and when a conscious effort is made to overcome particular problems, then a videotape replay becomes an instrument of learning.

SYMPOSIUM:

John H. Pennybacker

VII. EVALUATING VIDEOTAPE RECORDERS

THE educator who has become accustomed to a measure of standardization in audio-visual equipment[1] may find himself baffled when he turns to the relatively new field of television recording. It is unfortunate that, in the area of lower-priced, helical-scan television recorders, the industry has adopted no standards and no single manufacturer has achieved the dominance necessary to impose standards. As a result, the prospective purchaser finds a bewildering array of choices. This article attempts to clear up some of the confusion surrounding television recording equipment.

The first recording equipment to be marketed employed two-inch wide tape and a spinning wheel rotating on a plane at right angles to the direction of tape movement. Four recording heads were mounted on the wheel in such a way as to permit one head to make contact at the top of the moving tape as the second head lost contact at the bottom. Only one head was thus in contact with the tape at any given time and the information was placed on the tape in a series of diagonal stripes caused by the combined action of the moving head and the moving tape.

These recorders, called *quadruplex* machines, are still used commercially and produce the best recordings for broadcast purposes. There are two firms manufacturing them in the United States, the Ampex Corporation and RCA, and it is possible to interchange tapes between the two different models. There are three distinctive types of quadruplex recorders: black and white, low-band color, and high-band color.

In recent years a second type of television recorder has been introduced. It is generally called *helical-scan* recording and uses either one or two recording heads. The tape is kept in contact with the head or heads for a longer period by wrapping it around a center drum within which the heads rotate. No agreement has been reached on standards for helical scan machines and many varieties are available.

In choosing a tape recorder, the purchaser should consider seven important variables.

1. *Price.* Videotape recorders range in price from $1,000.00 to $100,000.00. The largest break in this range lies between helical-scan and quadruplex machines. The top price of helical-scan is in the neighborhood of $15,000 and the lowest price for a quadruplex recorder is approximately $22,000.00.

2. *Compatability.* An unfortunate result of the variety of helical-scan recorders available is the fact that tapes cannot be interchanged between recorders manufactured by different firms. Indeed, in many cases it is not possible to interchange tapes between different models produced by the same manufacturer. Ampex guarantees that a tape made on any of its machines using two-inch tape can be replayed on any other Ampex helical-scan two-inch recorder,

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1 Eight, 16 or 35 mm film; 3¾, 7½, and 15 IPS audio tape recorders; 78, 45, 33⅓ and 16 RPM disc recordings, etc.

and that all one-inch tapes in its line are interchangeable. Not all manufacturers make this guarantee.

Such incompatability seriously limits the degree to which institutions can exchange tapes and the flexibility of utilization within an organization. As a result, anyone planning to build a tape library or to set up a tape exchange must investigate carefully to insure that all recorders to be used will play his tapes.

3. *Broadcast vs. Closed-Circuit Quality.* The Federal Communications Commission has imposed certain standards on the electronic characteristics of any television signal that is broadcast (sent from point to point through space with no physical connection between). For closed-circuit uses (systems which carry signals on co-axial cable) it is not necessary to meet these standards. Some available recorders produce a picture that is acceptable for closed-circuit uses but not for broadcast. If it is anticipated that broadcast quality tapes will be needed at any time, however, the user must spend the extra money to meet F.C.C. requirements.

4. *Portability.* Although almost all helical-scan machines are advertised as "portable," they vary widely in size and weight. Some can be carried easily by a reasonably strong man; others come mounted in wheeled carts and may be rolled easily from room to room; still others are cumbersome and difficult to carry and are best left mounted in a central place (or in a small van or station wagon). The user should evaluate his needs carefully to be sure he is getting the degree of portability he desires.

5. *Editing.* As a practical matter, it is impossible to cut and splice helical-scan recording tape as you would audio tape. Some expensive models come equipped with, or have available as accessories, electronic editing equipment that permits erasing and simultaneous re-recording. Such editing requires a measure of skill and practice, however, and if extensive editing is forseen the user should consider film and subsequent dubbing on tape.

6. *Maintenance.* The potential buyer of television recording equipment often overlooks the question of maintenance. The electronics involved are quite complex and any system using television recording extensively should include the cost of at least one full-time engineer in its budget planning. Maintenance contracts are available, but service under these contracts, which include no preventive maintenance, can cause time-consuming delays and the possibility of seeing the recorder taken back to the shop.

The mechanical problems of maintenance and replacement of recording heads, maintenance of the tape transport mechanism, and operation of the recorders must not be overlooked either. Television recorders are much more complex than audio machines and, generally, should not be turned over to students for operation without close supervision.

The problems surrounding electronic and mechanical maintenance, unfortunately, are most critical in the lower-priced machines, most of which do not have the interlocking safety features that protect more expensive recorders from mishandling.

7. *Color.* For most educators, the use of color is on the far horizon. It is possible today, however, to purchase helical-scan recorders that can be converted to color when it becomes necessary. Potential buyers who see the possibility of turning to color at a later date should check carefully to be sure their machines can be so converted.

A careful evaluation of needs in the light of the seven variables discussed above may help educators choose between the confusing variety of television recorders available today. Institutions planning high-volume broadcasting on an educational television station or the distribution of course material throughout a school-system by means of channels in the 2500 megahertz band (Instructional Fixed Television Service) should seriously consider purchasing the quadruplex machines which have become the standard of the broadcasting industry, produce an excellent broadcast quality picture, and offer the best compatability available.[2] Editing is possible on these machines and, with proper equipment, a skilled operator can physically cut and butt splice quadruplex tape.

The major disadvantage of the quadruplex recorder is the price, ranging from a low of approximately $22,000.00 to $100,000.00 for a top-line, high-band, color recorder. All such recorders are complex, both electronically and mechanically, and require the services of skilled video-tape engineers for maximum efficiency.

Although some models are mounted on wheeled cabinets for "portability," all of them are large and heavy and should be installed in a studio or large truck.

Helical-scan recorders offer more variety. Generally speaking, they fall into three major groups, depending on the width of the tape used: two-inch, one-inch, and one-half inch.

Ampex and Sony manufacture the two most commonly used two-inch tape recorder lines. Ampex produces the VR660-B at a price of approximately $8,000.00. Sony produces the PV-1200 line at a price competitive with the Ampex 660-B. Both recorders produce a broadcast quality signal to meet F.C.C. standards, but tapes made on the two machines are not interchangeable. Recorders in these lines are portable, requiring two strong men to carry one. They can be mounted on carts for transportation. The Ampex 660-B includes electronic editing, and similar equipment is available as an option in the Sony line. Maintenance requirements are less than those of quadruplex machines and, properly operated, these recorders have proven quite durable.

These two-inch recorders represent the "top of the line" for helical scan machines. They are widely used and libraries of tapes are being built and exchanged around the country. One of these two manufacturers will, in the next few years, probably become dominant and force a measure of standardization on the two-inch format.

Tape recorders using one-inch tape are more difficult to classify. Ampex has recently announced a new line with a price range of $995.00 (the VR 5000 available in February of 1968) to $16,500 (the VR 7800-16). Between these extremes lie the VR 6000, VR 7000, and VR 7500 lines. The manufacturer guarantees that tapes made on one of its one-inch recorders can be replayed on any other line of one-inch recorders it makes, and, with the exception of the VR 5000, that all will produce a broadcast quality signal. Weights vary, but the VR 5000 will probably be quite portable and other models may be mounted in carts. Editing is available only in the 7800 line.

Two other firms in the United States also manufacture one-inch recorders. The MVR Corporation (formerly Mach-

[2] This is not to say, however, that quadruplex compatability approaches perfection. Tapes made on a black-and-white, high-band, or low-band color machine must be replayed on similar machines. Also, a recorder that is out of alignment may produce a tape that it can play but which will give other recorders a great deal of trouble.

tronics, Inc.) recently entered the market with the MVR-65, a broadcast-quality recorder selling for $11,000.00. Tapes are compatable only with other machines in the MVR-65 line, but editing equipment is available. At 85 pounds, the machine is reasonably portable.

The Diamond Power Comany manufactures its DP-2 and DP-3 in the one-inch line. The DP-3 produces a broadcast quality signal, while the DP-2 does not. Editing is available for both.

Sony has also entered the one-inch field. The Sony EV 200 sells for $4,000.00, and the tapes are playable only on other recorders in the same line. It does not produce a broadcast quality signal, and editing equipment is available.

If recorders using the one-inch format measure up to the expectations of their manufacturers, it is possible that they eventually will be more widely used than two-inch machines. The extensive tape libraries being built up on two-inch tape across the country, however, will mean that the two-inch recorder will never be superceded completely (Ampex is guaranteeing that its 660-B will remain in production no matter how widely its one-inch line is accepted).

The one-half inch model has yet to see extensive use by educators. The major advantages of these recorders are their price (in the $1,000 to $1,500 range) and their portability. They can easily be carried into the classroom and used for recording and immediate playback with a minimum disruption of class routine. On the other hand, compatability even between many machines of the same line is questionable (although Sony does guarantee interchangeability between its one-half inch recorders), they do not produce a broadcast quality signal, and no editing equipment is available. Their major disadvantage, however, is the fact that their durability over extended use has yet to be proven and mechanical and electronic maintenance may be troublesome. Institutions considering the use of these recorders should begin by buying only one or two and keeping a careful record of head and tape life, hours of use, and hours of "down time" for maintenance.

If the one-half inch model proves itself, it can quickly find its place in the instructional media spectrum as a truly portable television tape recorder that can be used easily in the classroom for recording and immediate replay. Such use requires neither broadcast quality nor interchangeability and would be invaluable in skills courses or in the training of teachers, interviewers, councellors, clinicians, etc.

The major manufacturers of these one-half inch recorders are Japanese firms: Sony, Concord, and Shibaden. General Electric distributes recorders under its name, but these are produced by Sony. Westinghouse has also entered the field with a machine produced by a Japanese firm, but at this writing we were unable to determine the name of the original manufacturer.

In a field as fluid and fast-moving as electronics, it is inevitable that any survey of available products will omit an important manufacturer or a new line with different features. As a result, the potential purchaser of a television tape recorder may find himself faced with varieties of machines not discussed above. The major divisions (quadruplex and helical-scan, two-inch, one-inch, and one-half inch formats) and the general advantages and disadvantages of each will continue to apply, however, and we hope that this article will serve for some time as a rough guide through the shifting sands of the television recording industry.